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22 July 1981

Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 106

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STATUS OF POTENTIAL NUCLEAR PROLIFERATORS

Rome L'ESPRESSO in Italian 28 Jun 81 pp 45-48

[Article by Giovanni Maria Pace: "My Bomb, Regardless of How Little You Are"]

[Text] After the Israeli raid on Iraq, the issue of the "poor man's bomb" has been on the order of the day. But it is said that a fission bomb, like the one dropped on Japan in the final days of the war, is the only one that can be within reach of developing countries. In fact, the fusion, or hydrogen, bomb presupposes possession of much more sophisticated technologies. Let us talk, therefore, about the fission bomb. Who has it? Who is building it? And with what means?

Iraq. All the Iraqi nuclear plants are under the supervision of the International Atomic Energy Agency (IAEA), because the country has been adhering to the Nonproliferation Treaty since 1970. The last inspection of the Tamuz 1 and Tamuz 2 reactors, destroyed by the Israelis, was completed in January. In Vienna they say that "there was no sign of diversion toward war uses." In addition, the statement by the Israelis that there was said to be a secret chamber under the reactor for irradiating fertile material and for making it fissile, that is to say usable in a bomb, is judged by the IAEA as "technically ridiculous." In addition to the two reactors that were bombed, Iraq has a third research reactor supplied by the Soviet Union and that started operating in 1967. With the abundant petrodollars available to them the Iraqi seem to have the intention of buying from France also a 700-megawatt powerplant, while, on the basis of an agreement signed in 1978 with Italy, our country is supplying the Tuwaitha research center with four laboratories, one of which is for extracting plutonium from spent fuel.

Pakistan. This country also, like Iraq, has the technicians and the equipment needed to build the bomb. It has not signed the Nonproliferation Treaty and it has agreed to inspection by the Vienna agency, outside the TNP [Nonproliferation Treaty], limited to certain facilities. That is to say, that a dual system governs in Pakistan--part of nuclear energy under international safeguard and part withdrawn from it--that may favor proliferation. At present, Pakistan has a research reactor and a power reactor. The research reactor, of the swimming pool type, has a power of 5 megawatts thermal and has been in operation since 1965. The power reactor, with 137 megawatts electric, is of the pressurized water type and has been in operation since 1972. It is capable of producing 24 kilograms of plutonium (after separation from "burnt' fuel) a year. But Pakistan seems to be following another course toward nuclear explosives, the course of building its own uranium enrichment plant. A couple of years ago, a Pakistani technician who was working in the Dutch nuclear

industry, Abdul Qadir Khan, began to buy parts of a plant for obtaining uranium 235 in Europe, from several suppliers, in order not to attract attention. American secret services became aware of this and President Carter suspended economic aid to Pakistan. The president, General Zia-ul-Haq, can count, however, on a rich ally, Colonel al-Qadhdhafi.

Libya. Although he has ratified the Nonproliferation Treaty, al-Qadhdhafi has never concealed his intention to succeed in building directly, or through a third country, the "Islamic bomb." His approaches to the countries having the technology (United States, France) have been, however, rejected for the most part. Negotiations with Paris for the installation of a 600-megawatt gas-graphite power plant were not successful. Therefore, the colonel turned to the Russians who are building a research center and a 2-megawatt powerplant. A 440-megawatt powerplant, also Soviet, seems to be within reach of Tripoli. But the "Mohammed bomb" is still far off. This is why the colonel is watching with interest the efforts of the Pakistani president, General Zia-ul-Haq, to whom he seems to be furnishing economic assistance. Among other things, Libya is rich in uranium, found in the Marzuq Basin and the Aozou Strip, claimed by Libya against Chad. With uranium and reactors, al-Qadhdhafi might also materialize another dream: to desalinate seawater and make the desert fertile.

Israel. It has never admitted, but it has never denied, that it has the bomb. In view of the level of its technicians and long participation (the Israeli Atomic Energy Commission dates from 1952), the country's nuclear capability is unquestionable. The basis for the Israeli military program is the 26-megawatt reactor supplied by the French in 1959 and operating at Dimona, in the Negev Desert. This reactor was, perhaps, the destination of the 200 metric tons of uranium that disappeared in November 1968 (episode known as the "Plumbat Affair"), after General De Gaulle had suspended nuclear collaboration with Israel. Alongside the top secret center at Dimona, Israel has a disclosed nuclear complex at Soreq visited regularly every 2 months by IAEA inspectors.

India. Although in 16th place, this country is a nuclear power. In fact, it has 10,000 technicians, four operating reactors and four more under construction. According to the latest IAEA annual report, it produces more electricity from the atom than Italy: 3.5 percent of the total, compared with our 1.3 percent. In 1974, India exploded its first atom bomb, prepared in great secrecy by diverting from a "peaceful" reactor, supplied in good faith by the Canadians, fuel that had just been irradiated from which they extracted plutonium. In addition to the countries that have crossed the nuclear threshold, there is a whole serie of sorcerer's apprentices, that is to say of nations, working hard at the technology of the atom.

Egypt. On 26 February of this year, Egypt adhered to the Nuclear Nonproliferation Treaty. It has a radioisotope laboratory in the University of Alexandria and a 2-megawatt reactor built at Inchass [sic] by the Soviets in 1961. It is scheduling construction of a 600-megawatt Westinghouse powerplant at Sidi-Kreir and another plant in the Sinai, in collaboration with Israel. It has recoverable uranium reserves in the phosphate rocks.

Persian Gulf countries. Saudi Arabia has not signed the Nonproliferation Treaty. It has a nuclear research center that includes a 5-megawatt reactor furnished by France and a sizable uranium prospecting program in collaboration with France, the United States and IAEA. Iran has ratified the treaty. It has a radioisotope center under

construction at the University of Tehran. It participates financially in European uranium enrichment enterprises. It has canceled four orders for large nucleo-electric powerplants (two from Germany and two from France), as well, also, as the uranium prospecting program. Kuwait has signed the TNP and plans to buy four powerplants with a total of 3,600 megawatts between now and 2000. For the moment, it has suspended an order for a 50-megawatt reactor while its participation in a regional nuclear program, together with Bahrain and Saudi Arabia, is being debated. Everyone wants his own bomb, not only in the Middle East. The race for the atom is also underway elsewhere.

South Africa. On 22 September 1979, the American Vela satellite recorded a double high-intensity flash while it was flying over the southern hemisphere. What had caused it? Although the experts have not succeeded in providing a definite explanation, there still is doubt that a South African nuclear experiment was involved. The assumption is supported by the fact that South Africa certainly has the technological capability of building the bomb, a capability that it has acquired in a profitable collaboration relationship with the Federal Republic of Germany. The Bonn-Pretoria Axis produced, among other things, a new method for enriching uranium, a mineral of which South Africa has a good supply. The country has two powerplants with a total of 1,842 megawatts under construction.

Latin America. The Argentine generals also like German nuclear technology. Kraftwerk Union built the first powerplant to go in operation in that country and has won the race for the third, which will be built at Atucha and will have a power of 700 megawatts (the second powerplant is being fitted out by the Canadians). The Argentine project is ambitious. Adm Carlos Castro Madero recently confirmed the intention of his country--which has not signed either the TNP in Tlatelulco, nor the treaty banning nuclear weapons from Latin America--to provide itself with a plant for producing heavy water, the typical moderator for the technology of natural uranium reactors. This plant will cause Argentina to achieve nuclear autarchy, both with regard to electricity and to explosives. The United States is applying pressure on Germany to limit its contribution. A clash like the one that occurred in 1975 in connection with collaboration between the Germans and the Brazilian Government, which the Americans regarded as a violation of the agreements on proliferation, is shaping up.

Far East. There has been talk for years of Taiwan's (Formosa) nuclear ambitions. It is said to see in the bomb its only defense against the expansionism of the People's Republic of China, which already has a 564-megawatt reactor and has six more under construction with a total power of almost 5,000 megawatts.

10,042
CSO: 5100/2279

BRIEFS

BRAZIL URANIUM SALE TO IRAQ DENIED--Baghdad, 7 Jul (INA)--Iraq has denied the Zionist entity's allegations that Brazil has supplied Iraq with uranium. In a statement to INA today, an official spokesman of the Iraqi Foreign Ministry said: Under the effect of the large-scale international condemnation of its recent aggression against Iraq, the Zionist entity is circulating such false reports, erroneously believing that this method might affect the relations of friendship and cooperation between Iraq and world countries. The spokesman stressed that the lies and rumors being circulated by the Zionist enemy aim at diverting world public opinion away from its crimes against Iraq and at harming Iraq's developing international relations. Concluding his statement, the spokesman emphasized that Iraq is determined to continue its firm march to possess as much scientific know-how as possible to bring about comprehensive progress and development within the context of an ideology founded on avowed bases known for their civilized and humane dimensions. [Text] [JN071026 Baghdad INA in Arabic 1000 GMT 7 Jul 81]

CSO: 5100/2283

BRIEFS

AUSTRALIAN URANIUM TO PHILIPPINES--Australia will provide the Philippines with enough supply of uranium as raw material fuel for the country's nuclear power plant being built in Morong, Bataan. This assurance was given by the Australian ambassador, Richard Woolcott, in a speech at the opening Thursday of a 2-day [words indistinct] conference of the Australian-Philippine Business Cooperation Committee. Ambassador Woolcott also pledged a continuing aid program for the Philippines in the use of coal and the expansion of bilateral trade and investment. In his speech Woolcott said Australia expects to meet the Philippines' requirements of about 840 tons of uranium between 1985 and 1990. [Text] [HK030041 Manila FEBC in English 2330 GMT 2 Jul 81]

CSO: 5100/2283

EXPERT DESCRIBES AUSTRALIA'S ABILITY TO MAKE A-BOMB

Canberra THE AUSTRALIAN in English 15 Jun 81 p 1

[Article by Peter Terry]

[Text]

A DEFENCE expert has drawn up a research paper detailing how much it would cost this country to acquire and maintain a nuclear strike force.

The document poses horrific scenarios for using the weapons and tells of a loophole in the Nuclear Non-Proliferation Treaty which would permit Australia to build atomic bombs.

The document was prepared by a former NATO adviser, Dr Geoffrey Williams, who is now head of the strategic and defence studies unit at the West Australian Institute of Technology.

He is being financed by the West Australian Government to investigate the civil defence of Perth in the event of a nuclear attack.

In the paper, Dr Williams says scientists in this country know enough about nuclear technology to make a small number of bombs within a year or so.

WEAPONS

"It would take roughly two years to embark on an advanced weapons technology, after which enough fuel could be produced to make about 50 weapons a year for about $100 million a year," he says.

"After 10 years, Australia could have a nuclear-armed cruise missile system for a cost of about $2000 million or less."

Dr Williams makes it clear that he is not advocating Australia build its own nuclear strike force, but he gives reasons why it might decide to go nuclear.

"Indonesia under a more warlike leadership bent on producing, or acquiring, nuclear weapons could in the late 1980s compel Canberra to decide in favor of the nuclear option," he says.

He gives two examples when Australia might threaten to use the bomb.

In the late 1980s Australia could be faced with a more definite threat from revolutionary states to force it to accept large numbers of their people, he says. This could provoke it into a nuclear posture.

Another possibility was if there was a major nuclear conflict with "horrendous" damage in the northern hemisphere when perhaps only a nuclear threat could deter an "uncontrollable" invasion here of panic-stricken people.

He says a loophole in the Nuclear Non-Proliferation Treaty would allow a determined government to acquire nuclear arms.

CSO: 5100/7545

AUSTRALIAN URANIUM COULD BE GETTING INTO IRAQ

Canberra THE AUSTRALIAN in English 15 Jun 81 p 3

[Article by Nicholas Rothwell]

[Text]

URANIUM shipped from Brisbane could be finding its way into the Iraqi nuclear reactor program and the Muslim atomic bomb, environmental groups in Canada claimed yesterday.

Australian uranium is being transported by rail through Canada for eventual shipment elsewhere, members of the Canadian Greenpeace group said.

One shipment of 12 cases of uranium concentrate was unloaded in Vancouver yesterday where independent nuclear physicists found it to be emitting between 100 and 200 times the environmental level of radiation.

Canadian Government scientists declared the shipment safe.

The shipment had been delayed in rail sidings at Brisbane for six weeks because bans imposed by the Queensland Seamens' Union and Electrical Trades Union had prevented its being loaded on to a Norwegian cargo ship.

A Greenpeace spokesman in Vancouver, Mr Doug Mulhall, said yesterday Canadian officials had confirmed some of the consignment was bound for the US and England.

Uranium is often sold by Canada to France, a non-signatory of the nuclear safeguards provisions, which supplied fuel for the Iraqi reactor bombed this week by the Israeli Air Force.

Canadian unions will try to prevent the train carrying the 149-tonne shipment reaching its final destination — Port Hope, Ontario.

Tomorrow they will consider bans on all future shipment of uranium from Australia and may place bans on all Australian trade entering Vancouver harbor.

CSO: 5100/7545

QUEENSLAND PREMIER LAYS DOWNER SAFEGUARDS FOR URANIUM

Support For Naval Reactors

Brisbane THE COURIER-MAIL in English 16 Jun 95 p 3

[Text]

THE Premier, Mr Rolfe-Petersen, yesterday urged the Federal Government to forge its safeguard conditions for the sale of Australian uranium overseas.

[illegible]

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Newsbrown, TNS, [illegible], to Baghdad, 17 June '99, p. 13.

[illegible]

TNS Queensland Premier's attitudes towards selling uranium mark "unacceptable, criminal and reprehensible", the co-ordinator of the Campaign Against Nuclear Power, Ms Jane Sheers, said in Brisbane yesterday.

[illegible]

[redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted]

Gasbarra Consideration

Mediaworld FBIS edit to English 14 Jun 91 p 17

[Text]

[redacted]

Aseay Remarks

Sociatrade FBIS [redacted] to English 17 Jun 91 p 13

[Article by Eva Neuvigen]

[Text]

[redacted]

[redacted]

[redacted]

6A. INDUSTRY JOIN IN URANIUM PROCESSING FEASIBILITY STUDY

Cost-Sharing Scheme

Canberra THE AUSTRALIAN in English 22 Jun 81 p 1

[Article by Ian Perkin and Alan Craig]

[Text]

A POWERFUL group of industrialists has joined the South Australian Government in a $[illegible] feasibility study as a forerunner to a $[illegible] million Australian uranium processing industry.

The study will examine the establishment of a uranium-conversion plant at Port Pirie, South Australia.

Chemical processing in the proposed plant would convert yellowcake into uranium hexafluoride — the feedstock for a uranium enrichment industry.

The proposed development would integrate Australia in the downstream of the world nuclear fuel industry.

But the major stumbling block for the changing industry is uncertain long-term market volume and a broad policy of the ACTU and the Labor Party opposing uranium development in Australia.

The consortium making the feasibility study includes Broken Hill Associated Smelters Pty Ltd (BHAS), Broken Hill Proprietary Co Ltd (BHP), Rundle Management Services Pty Ltd (RMS) and the South Australian Government.

BHAS is owned by one of Australia's largest companies, CRA Ltd and North Broken Hill Ltd, and Rundle Management Services Pty Ltd is owned by the partners in Cockburn Cement (Western Australia), Western Mining Corporation and the oil giant BP Australia Ltd.

The $[illegible] uranium-conversion study is in addition to a $[illegible] study being carried out by the Uranium Enrichment Group of Australia (UEGA) into uranium-enrichment technologies.

But that will link with the South Australia study to be completed in 18 months and on its own predecessor UEGA could run in its years.

Partners in the UEGA group are the Broken Hill Pty Co Ltd (BHP), CRA Ltd, Peko-Wallsend Ltd and one of the members of the South Australian study group, Western Mining Corporation.

But the two studies are closely linked. Because any South South Australian uranium plant would be likely to provide the uranium feedstock for a future uranium-enrichment plant.

The UEGA group which has a brief from the Federal Government, is considering six key types of uranium enrichment technology — the French gaseous diffusion type and the European centrifuge type.

But both are uneconomic long-term, the product of the proposed South Australian plant on their base feedstock.

The uranium-conversion feasibility study would seek to put South Australia in the front running for the construction of a $[illegible] million uranium enrichment plant.

Together with the launching of a successful uranium-mining and milling operation in Roxby Downs in the north of the State it could add up to a resurgence in the South Australian economy.

But the announcement could also bring an adverse union reaction.

The president of the ACTU president, Mr Cliff Dolan, was unavailable for comment yesterday.

The South Australian Government is fully behind the project, giving [illegible] [illegible] has been sharing in the costs.

The State's Minister of Mines and Energy, Mr Goldsworthy, said: "The proposed study is a significant commitment by the consortium and the companies and [illegible] [illegible] uranium processing, [illegible] which South Australia has been pursuing since 1979.

The South Australian Government [illegible] [illegible] [illegible] the study was [illegible] [illegible] [illegible] in South Australia.

The South Australian Government will contribute [illegible] of the [illegible] of the [illegible] [illegible] [illegible] per cent and [illegible] per cent.

Economic Impact Projection

Canberra THE AUSTRALIAN in English 22 Jun 81 p 13

[Commentary by Ian Perkin, financial editor]

[Text]

THE decision by several major Australian and overseas companies to team up with the South Australian Government to study the prospects for local uranium conversion is a major boost for the industry.

It is also potentially a significant boost for the SA economy, inspiring, as it does, the likely early development of the huge Roxby Downs uranium-copper-gold prospect in the State.

The Roxby Downs (Olympic Dam) prospect is now being explored by Western Mining Corp and BP Australia Ltd and is expected to eventually be one of the biggest uranium and base metals prospects in the world.

Although further details of the proposed uranium conversion plant will have to await the outcome of the feasibility study, the plant would be likely to take uranium from Roxby Downs.

But it could also take uranium from other [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible].

[illegible] [illegible] [illegible] there was for Australia's first uranium enrichment plant.

Several other States have indicated they would welcome a uranium enrichment plant, particularly Queensland and WA.

But as the product from the proposed conversion plant — uranium hexafluoride — is the planned feedstock for uranium enrichment, the establishment of such a plant in the State would make it the likely site for a complementary enrichment plant.

The SA study complements the [illegible] million study already being undertaken by the Uranium Enrichment Group of Australia into the feasibility of uranium enrichment in this country.

Partners in the UEGA consortium include one of the companies in the SA group, [illegible] [illegible] [illegible] [illegible] group [illegible] [illegible] [illegible] in the [illegible] uranium prospect and [illegible].

The SA conversion study is expected to take 18 months.

It will examine the [illegible] [illegible] [illegible] the construction and operation of a conversion plant in the Port Pirie area would be viable.

The conversion of yellowcake to uranium hexafluoride is a chemical process.

A few nuclear power plants use natural uranium, but most require the concentration of a particular uranium isotope in their fuel to be increased from the natural level.

The first phase in achieving this is the production of uranium hexafluoride by chemical process, and this is then used as the feedstock in a large-scale enrichment plant.

[illegible]

[illegible]

Editorial Comment

Canberra THE AUSTRALIAN in English 22 Jun 81 p 6

[Editorial: "Facing Up to the Uranium Reality"]

[Text]

URANIUM is about to become a major political and industrial issue again — and the Australian Labor Party and the unions would do well to look at the reality of their policy stances now, rather than wait for the pot to boil over. The South Australian Government's decision, announced yesterday, to consider establishing a uranium treatment plant at Port Pirie is one issue which will return this controversial material to the forefront of debate. The matter of Australian exports of uranium is another.

At present, Australian firms are committed to export 2300 tonnes of uranium a year. This figure could be greatly increased by orders from countries already using or planning to use nuclear-generated power. But many orders — for treated or enriched material — are not likely while it is doubtful of the 2300 tonnes now under contract will leave the country.

The new pressure on Australia to export uranium to the world will come as a result of the pro-nuclear line taken by the International Energy Agency at its meeting last week in Paris. Its end-of-meeting communique unequivocally supported widespread development of nuclear power generation — not only pointing the way which developed and developing countries should take but also clearly indicating to uranium-producing countries (among which, of course, Australia is a leader) their responsibility to ensure supplies for global use. This reference had particular emphasis for us because the chairman of the meeting was Australia's Minister for National Development and Energy, Senator Carrick.

The IEA also stressed the importance of coal as an alternative to oil as a source of power — and estimated Australia should be exporting 120 million tonnes a year of thermal coal within 10 years ... 17 times its present seven million tonnes. However, we will not be able to approach that figure without massive investment in ports, coal loaders and other facilities quite apart from the development of coal mines themselves. As obvious source of money is uranium exports — indeed, it is the only source if we do not want

to call on more foreign investment and sell off more of the farm. And it is in this context that the ALP and the unions must look at where they stand.

The world will get its uranium, whether we supply it or not. That is the reality. Others are not frightened or opposed to its use as a power source. Should we be? Can we afford to be playing politics (and that is really what many anti-nuclear activists are doing) while the rest of the world leaves us, our uranium and our overall development behind?

ALP, Union Opposition

Canberra THE AUSTRALIAN in English 23 Jun 81 p 1

[Article by Russell Schneider, Peter Blunden and Merrell Hachinson]

[Text]

A UNITED "no" from the Australian Labor Party and the ACTU yesterday torpedoed federal and South Australian Government plans to launch a $1000 million national uranium processing industry.

The ALP warned it would veto the plant if it came to power, while the ACTU said the union movement would refuse to build or man the proposed plant.

The Opposition Leader, Mr Hayden, said a Labor government — under the party's existing policy — would refuse export permits for processed uranium unless satisfied the developers could meet Labor-imposed safety guidelines.

He said Labor's requirement was for complete safety in the handling and disposal of uranium, as well as invoked international agreements which reduced the risk of nuclear war.

Mr Hayden said he was optimistic some of the technological drawbacks could be overcome and Labor could at some point allow the mining, export and processing of uranium.

But he warned that the consortium wishing to build the South Australian plant should only go ahead if it was absolutely satisfied it could meet these criteria by completion.

The ACTU president, Mr Dolan, said yesterday after a meeting with the Prime Minister, Mr Fraser, that the union movement would continue to total opposition to uranium development.

"Our policy is one of complete opposition to the exploitation of Australian uranium deposits and its export," he said. "The South Australian plant is a further development, making Australia a real part of the nuclear cycle."

Mr Dolan will receive opposition to the plant when he addresses a meeting in Adelaide today and visits Port Pirie, the potential site of Australia's first uranium reprocessing plant.

The South Australian Government has authorised a $500,000 feasibility study by a group of powerful industrialists as a forerunner to developing the plant.

Mr Hayden left himself only one way out from the Labor Party's hard-line stand — that any "objective decision" would be made by the ministers in a Labor government.

He avoided saying whether he personally favored a change in ALP policy.

Meanwhile South Australia's powerful United Trades and Labor Council yesterday said it would refuse to have anything to do with the building or running of any uranium processing plant.

Union fears were foreshadowed by the secretary of the South Australian Trades and Labor Council, Mr Bob Gregory, who said he did not believe the plant could be built without the co-operation of the council.

"Nobody has yet been able to convince us it would be safe to work in such a plant," he said.

However, the South Australian Minister for Mines and Energy, Mr Goldsworthy, said union opposition to the plant

was premature and presupposed that the ALP and ACTU would not alter anti-uranium policies.

He said there was growing pressure in the union movement and the ALP to soften the stand against the mining and conversion of uranium.

It would only be a matter of time before the ALP looked dispassionately at evidence overseas, dealt in facts and changed its view.

Mr Coldsworthy strongly attacked suggestions a Labor government would veto plans for the plant. He said the constitutional implications of such a stand would be studied.

Sources indicate the plant would cost about $80 million. It would be undertaken by Broken Hill Associated Smelters, British Nuclear Fuels Ltd and Roxby Management Services Pty Ltd.

The feasibility study decision is seen as heralding an almost certain go-ahead for development of the giant Roxby Downs deposits of uranium, copper and gold in the State.

Western Mining Corporation, which is developing Roxby Downs with the British BP group, is taking part in the study.

CSO: S100/7546

GOVERNMENT AGREES TO INCREASE URANIUM EXPORTS

Canberra THE AUSTRALIAN in English 17 Jun 81 p 17

[Article by Russell Schneider]

[Text]

THE Federal Government has agreed to international demands that Australia should increase its uranium exports to overcome the world energy crisis.

The Minister for National Development, Senator Carrick, has agreed to an International Energy Agency demand that all IEA nations upgrade their supply or use of uranium as an oil alternative.

The IEA — and through Senator Carrick, the Australian Government — has agreed that:

- THE public should be encouraged to accept the safety of nuclear reactors.
- REGULATORY practices should not unnecessarily constrain investment in the nuclear industry.
- THERE should be more reliable and predictable supplies of nuclear fuels.

The IEA decision will give Cabinet Ministers anxious to increase uranium exports — now running at 2300 tonnes a year — stronger arguments to expand the uranium mining industry.

The IEA decision comes only days after nuclear physicist Dr Edward Teller, in an exclusive interview in *The Australian*, urged rapid development of local uranium deposits.

Dr Teller said changing technology would lead to a fall in demand for uranium within 20 years and unless Australia moved quickly to expand its industry it would be left behind.

A number of ministers share this view and are anxious to promote more rapid development of uranium deposits in the Northern Territory and elsewhere.

The blunt message from the IEA is that Australia should either make massive increases in its coal exports or provide more uranium for energy hungry countries.

The IEA has estimated that Australia could expand its steaming coal exports from the present seven million tonnes a year to 120 million tonnes by 2000. But this would cause major logistics problems in developing the coalfields and loading bulk supplies.

The IEA meeting held in Paris this week agreed nuclear power would play a "major and increasing role" in many countries if the world was to move away from major reliance on oil.

"This will be facilitated by better conditions for the timely growth of nuclear power," the communique said.

In an obvious reference to Australia, the energy ministers demanded that "regulatory practices" should not "unnecessarily constrain investment".

CSO: 5100/7545

YELLOW CAKE CONVERSION TO URANIUM HEXAFLUORIDE STUDIED

Rangoon THE WORKING PEOPLE'S DAILY in English 23 Jun 81 p 6

[Text] **CANBERRA, 21 June—A joint venture to study the feasibility of converting uranium oxide (yellow cake) to uranium hexafluoride was announced in Melbourne today by Conzinc Riotinto of Australia Ltd.**

This is expected to cost over half a million Australian dollars (approximately 575,650 US). The study will take about 18 months to complete and will enable the participants to decide whether the construction and operation of a uranium-conversion plant in the Port Pirie area of South Australia would be economically viable.

The group undertaking the joint venture comprises the Broken Hill Associated Smelters Pty Limited (BHAS), British Nuclear Fuels Limited (BNFL), Roxby Management Services Pty Limited (RMS) and the South Australain Government. The cost will be shared in a proportion of 35 per cent by BHAS, 30 per cent BNFL and RMS and five per cent by the South Australian Government.

The conversion of yellow cake to uranium hexafluoride is a chemical process. A few nuclear-power plants use natural uranium, but most require the proportions of a particular uranium isotope in their fuel to be increased from the natural level. The first phase in achieving this is the production of uranium hexafluoride by chemical process.

The study will consider the use of the specialized technology developed by British Nuclear Fuels Limited, one of the leading uranium-processing companies.

The formation of this joint venture brings together the South Australian Government, BNFL and companies which have strong interests in South Australia. It will allow the participants to draw on their expertise in uranium production, chemical processing and marketing in assessing the feasibility of producing uranium hexafluoride in South Australia.

The Broken Hill Associated Smelters Pty Ltd, which is owned by the mining companies CRA (70 per cent) and North Broken Hill (30 per cent), operates the world's largest lead smelter at Port Pirie. Roxby Management Services Pty Limited is the manager of the joint venture at Roxby Downs between Roxby Mining Corporation Pty Limited (a wholly-owned subsidiary of Western Mining Corporation) and BP Australia. The RMS interest in the new joint venture is shared equally between Western Mining Corporation and BP Australia.

Any proposal to construct and operate a conversion plant would be subject to the requirements of the Environment Protection Act and any other relevant federal and state government laws and regulations.*NAB/AFP*

CSO: 5100

YELLOWCAKE REMAINS AT DARWIN WHARF IN UNION ACTION

Canberra THE WEEKEND AUSTRALIAN in English 13-14 Jun 81 p 13

[Article by David Trounce]

[Text]

UNIONS in the Northern Territory have failed to keep uranium in the ground – but they look like succeeding in keeping it on the wharf.

Combined bans by the Seamen's Union and the Waterside Workers Federation in Darwin have prevented any shipments of yellowcake leaving Darwin since February.

This is despite the fact that members of the Miscellaneous Workers Union have been happily mining the only Northern Territory mine in production, Queensland Mines' Nabarlek.

Union officials estimate that up to 1000 tonnes of yellowcake are stockpiled at Nabarlek and in Darwin, but Queensland Mines refuses to discuss the figure.

The mining company shipped out two small loads to Singapore using a Darwin barge firm before the bans were imposed.

They are now three shipments behind in their contract and the Japanese customers are asking Queensland Mines to look at other means.

In the meantime, the Seamen's Union has actually agreed to postpone requests for increased crew levels on the barge firm's other coastal services as a gesture to alleviate possible financial hardship.

Two businessmen are trying to hire a Singapore-registered barge with a foreign crew and hope either to sneak into a private landing in Darwin or dock at a remote jetty on the Arnhem Land coast.

This could lead to the ironic situation where the Government will have to call in the police to enforce maritime regulations which require foreign-registered vessels to dock at authorised wharves – in this case, Darwin Harbor – where the unions will be waiting.

CSO: 5100/7545

UNION BARS URANIUM SHIP FROM LEAVING BRISBANE

Canberra THE AUSTRALIAN in English 18 Jun 81 p 2

[Article by Jacky Archer and Nicholas Rothwell]

[Excerpt]

A BRITISH ship which has been loaded with containers of uranium will not be allowed to leave port, according to the Australian Seamen's Union.

The union's Queensland secretary, Mr Jim Steele, said yesterday that a ban on the ship leaving Brisbane's Hamilton terminal where it loaded uranium on Tuesday would not be lifted.

He said: "As far as we're concerned, the ship will be made into a monument. It will be used as an example to show that uranium loading just will not be tolerated in Brisbane."

The ship, A.C.T. IV, owned by the British consortium ACTA, took on seven containers of uranium yellowcake. It was to have left early on Tuesday.

The union ban has stopped tugs from working the vessel and the pilot, who did not want to be identified, has said he would not take the ship to sea without their help.

In Vancouver, a spokesman for the Greenpeace organisation, Mr Doug Mulhall, claimed yesterday that the Australian fuel could easily be used in Soviet warheads since Canada had little control over the uranium it exported.

Canada takes the Australian yellowcake to enrich it for sale to countries such as the Soviet Union, France and Britain.

The British Columbian Federation of Labour has put a ban on uranium shipments and Greenpeace members have protested at the rail transport of Australian uranium.

A spokesman for the Department of Foreign Affairs in Canberra said yesterday the shipments of uranium were bound for Japan and West Germany.

Four shipments of Australian uranium have gone from Brisbane to Vancouver since last September.

CSO: 5100/7545

BRIEFS

KOONGARRA SENATE APPROVAL--Canberra--The controversial bill to change the boundaries of the Northern Territory's Kakadu National Park passed through the Senate without amendment yesterday--but not without protest. The Australian Democrat Senator Colin Mason voted with the Opposition during a division on the Bill which alters the boundaries of the national park to allow Denison Mines of Canada to extend its Koongarra uranium deposit into the former park area. The Opposition's spokesman for Aboriginal Affairs, Senator Susan Ryan, said, however, that the Koongarra Bill enshrined a lie in legislation. She claimed this was because the Bill deemed that legislative requirements for public consultation and proper Parliamentary scrutiny had been complied with when they had not. "The Bill clears the last legislative hurdle in the path of the Koongarra uranium mine, a mine which in the public interest should never go ahead," she said. She pointed out that the Fox Report had recommended against developing the Koongarra deposit because of the danger of contamination of the Woolwonga wetlands, described as "the most important refuge and habitat for aquatic wildlife in the Northern Territory." [Excerpts] [Sydney THE SYDNEY MORNING HERALD in English 13 Jun 81 p 5]

CSO: 5100/7547

COST OF TRAINING NUCLEAR TECHNICIANS SET AT U.S.$ 3 MILLION

Rio de Janeiro O GLOBO in Portuguese 3 Jun 81 p 32

[Text] The training of the first team of nuclear powerplant operators, conducted essentially outside of the country, cost a total of 32 million, or 177 million cruzeiros. This activity has become the newest Brazilian profession, and is being regulated by the Ministry of Labor.

In making the information available yesterday in Rio, engineer Mario Costa, the superintendent of technical generation at Furnas, claimed that this is a highly justifiable investment, because "the national pride and prestige are involved" in it. The team, with the authority to make decisions regarding the starting of the plant, emergency stoppage, loading and reloading, will have hundreds of instruments in its care and safekeeping.

The engineer noted that, after 1984, the costs of this training will be considerably reduced, because the country will have available a simulator, to be installed by NUCLEBRAS [Brazilian Nuclear Corporations] at Angra II. The first team consists of 11 engineers, three physicists and 12 intermediate-level technicians. They are due to receive their licensing document from the National Nuclear Energy Commission (CNEN) within a short time. Another team, half the size of the present one, is being trained by Furnas. The powerplant will have a total contingent of 60 technicians, who will work on 8-hour shifts. On each one of these shifts, three of the operators licensed by the CNEN will be present.

Training

The training with the simulator was carried out at the powerplant in Zion, Illinois, in the United States, for 5 months, and during a 6-month apprenticeship in powerplants in the same country. Mario Costa reported that the personnel who were trained received all the essential information for operating Angra I, starting on 6 July, when the fuel was placed in the reactor's core.

The operators are ranked in two groups: senior reactor operator (SRO) and reactor operator (RO). The first group is responsible for starting, stopping, dealing on emergencies and making the change in load and reload. The RO can operate the starting, stopping and auxiliary (not from a command standpoint) controls of the reactor in emergency situations. According to the Furnas engineer, they are fully qualified for this work, and this has already been carefully checked, particularly in the written (12 hour) and oral (7-hour) tests given by the CNEN.

The minimum education and experience required for RO operators is 2 years and 6 months for the higher level personnel (with 6 months of nuclear experience) and 2 years (with 6 months of nuclear experience) for the RO operators also on a higher level. For the intermediate-level personnel, the requirement is 1 years of experience, with 6 years in the nuclear area.

Panelists made stressed the fact that the requirements for training the task were based on an international average, and included costs associated to materials, travel, training per se, materials and other needs. We gave a reminder that the importance of the training of these mechanisms is directly linked with the need for performing the task of putting Brazil in an international nuclear context.

(END)
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URANIUM RESERVES VALUED AT U.S.$ 24 BILLION

Rio de Janeiro JORNAL DO BRASIL in Portuguese 5 Jun 81 p 13

[Text] Even with the reduction in prices of a kilogram of uranium, currently quoted at $84.00, after having reached $99.00 on the world market, Brazil's reserves of 130,000 tons are valued at $24.1 billion, according to reports from sources in the nuclear sector. They are sufficient to feed 10 reactors of the type at powerplant II (PWR), with 1,300 megawatts, at Angra dos Reis, for 73 years, or 30 reactors for 24 years.

According to the source, the price of uranium declined in recent years because there was a slight slowdown in the building of powerplants in Germany and the United States. In Europe, only France has been keeping its program for nuclear powerplant construction normal. However, the source is of the opinion that the prices should rise during this decade in the event that Germany builds its 10 scheduled reactors.

The technician claims that the prices are low, but no country is attempting to sell uranium, preferring to keep large volumes as strategic reserves. He accused the United States, Canada, Australia and South Africa of forming a "uranium cartel," called the "blue-eyed Arabs" in Europe.

He says that the 130,000 tons of Brazilian uranium reserves, after being processed, are converted into "yellow cake" and reduced to 150,000 tons. Their current price on the world market is $9.6 billion. The uranium is enriched at the rate of 6.4 kilograms of natural uranium to 1 kilogram of enriched uranium, with a factor of 4.2 per separation unit.

After this process, the 150,000 tons of "yellow-cake" are reduced to 23,000 tons of enriched uranium. At the current price of $150.00 per separation unit, this uranium would cost $14.1 billion which, added to the $9.6 billion, totals $24.1 billion.

A powerplant of the Angra II type consumes 31 tons of uranium per year, with an estimated load factor of 70 percent, the world average generation for a nuclear powerplant. In the reprocessing of the fuel from a nuclear plant, with a ton of this burned uranium 950 kilograms of almost natural uranium, and nearly 10 kilograms of plutonium are obtained.

2909
CSO: 5100/2274

DIFFICULTIES IN ARGENTINA, BRAZILIAN PROGRAMS EXAMINED

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 31 May 81 p 31

[Text] Buenos Aires (by special correspondent Jose Roberto Arruda)--Rather different concepts typify the Brazilian and Argentine nuclear programs, and perhaps more because of the difficulties which both are encountering along the way than because of natural affinity there may be justification for certain areas of complementation that explain the recent nuclear agreement signed between Vice Adm Carlos Castro Madero, of the Argentine National Atomic Energy Commission, and Paulo Nogueira Batista, of NUCLEBRAS [Brazilian Nuclear Corporations]. Problems of an economic nature, requiring heavy investments, which have been draining the forces of both countries, combined with obstacles of technological origin, with lags in the construction of nuclear powerplants, are common to both programs, and the North American pressure against the two programs is also mutual and intense.

The Argentines chose a course of action which ostensibly makes its nuclear program more secure and possible to accomplish over the medium term than the Brazilian one, opting for continuity in the construction of reactors powered with natural uranium and heavy water. The Argentines greatly reduced the problems associated with the fuel cycle, which could bring about self-sufficiency and independence in their program more quickly. The Argentines think that Brazil is running a serious risk with the option taken for the light water and enriched uranium line of reactors, because the process of enriching uranium purchased by Brazil from Germany has not yet been tested on an industrial scale. However, the vice-president of KWU [Kraftwerk Union], Hans Frewer, claims that the "jet-nozzle" process tests are showing a good "performance" and that, by 1985, Brazil will be enriching its own uranium, with the mounting of all the cascades in the industrial process. The German technicians from KWU imply to some extent that Brazil may have taken the last trolley in the history of uranium enrichment, because the other processes, such as gas diffusion and ultracentrifuge are in the hands of the North Americans, French and British, who will not release them. Even the Federal Republic of Germany can only develop its ultracentrifugal process on territory that is not its own, thanks to a trilateral agreement (Germany, Great Britain and the Netherlands) which created Urenco.

The "jet-nozzle" process is the major doubt in the Brazilian nuclear program, and the period of time that it will have to wait (nearly 5 years), with Brazil subjected to pressure from the U.S. State Department, is the major risk that the Argentines wanted to avoid. But there is also the doubt as to whether the Argentines might be able to obtain a ride from that Brazilian trolley.

Centro Modero stated that the Argentine nuclear program would cost $20 billion, whereas NUCLEBRAS estimates its program at only the original cost of $10.5 billion, which has already been exceeded considerably. Argentina started its program ahead of Brazil, and is more advanced,but the Brazilian program is more ambitious, and is intended to go much further. Argentina selected the heavy water and natural uranium reactors, which are more expensive than the PWR (Brazil's enriched uranium and light water reactors), but which nevertheless generate less power, at a higher cost per kilowatt.

Like Brazil in Angra dos Reis, Argentina has confronted problems with its nuclear powerplant at Embalse Rio Tercero, where a Canda reactor is being installed. The firm which won that bid was the consortium Atomic Energy of Canada, Ltd. and Italimpianti. Some problems of a technical nature have not yet been resolved, and that powerplant, which was due to be in operation, will not be ready until next year, with a power of 600 megawatts. Its cost is estimated at $1.56 billion and its construction was begun in 1972.

In addition to the Embalse powerplant, the program calls for the construction of Atucha-2, at an estimated cost of $1.89 billion, as well as three more powerplants, with unit prices of $2 billion, without a site for the construction.

Like NUCLEBRAS, the Argentine National Atomic Energy Commission has now decided to create a subsidiary to absorb the technology for management, engineering and construction from its similarly German partner, KWU. Also created was EBACE (Argentine Nuclear Enterprise for Electric Powerplants), to attempt self-sufficiency in that sector by the year 1997, so as to undertake the construction of the four new powerplants. A contract signed at the beginning of last year between CNEA (National Atomic Energy Commission) and a consortium of French-Agentine firms will make it possible to carry out the exploration of the Sierra Pintada deposits, whose current uranium reserves insure Argentine self-sufficiency. Also to be built on that site is a uranium concentration plant, with an annual capacity of 700 tons. In 1980, the Argentine production of uranium concentrate totaled nearly 200 tons, and possibilities are anticipated for the future export of the surplus produced.

In the Cordoba manufacturing complex, Argentine technology is seeking the process for uranium dioxide, while a factory is being built in that location to produce uranium dioxide.

For the processing of nuclear fuel elements, KWU is due to build a factory at the Ezeiza Atomic Center. Also under construction adjoining that site is the circaloy plant being built by the Special Alloys factory, to produce rods which are used to count the fuel elements; while the pilot plant to manufacture circonium sponge will be located at the Bariloche Atomic Center, the expansion of which to produce 10 tons per year is planned.

Also, in the installation of the infrastructure for its nuclear program, Argentina is attempting to build a test laboratory for irradiated fuels and materials, a high-pressure thermohydraulic circuit to examine and test fuel elements, and another low pressure one to test and check them before they enter the reactor. The program also involves research for the production of heavy water, with the construction of a pilot plant in the vicinity of Atucha, as well as a laboratory for work with hydrosulfuric acid. Meanwhile, to meet the immediate needs for heavy water for its

powerplants, Argentina purchased, with the turn-key system, a heavy water plant from the Swiss firm Sulzer, with an annual production capacity of 200,000 tons.

As is evident, Argentina will not need the enrichment plant, because its reactors are powered by natural uranium and heavy water. During the reprocessing phase, its research has been conducted on its own, and Argentina will not be in a position to purchase that technology. With a supply of 3,000 irradiated elements in the Atucha-1 nuclear powerplant, the pool is being expanded with the construction of another annex building, which it will have to store irradiated fuel elements for another 15 years, until a solution is found for the problem. The Brazilian nuclear program depends on the slogan "Pacta Sunt Servanda" [agreements are kept]; in other words, it depends on total fulfillment of the agreement on the part of the Federal Republic of Germany, despite the pressure to which it has been subjected. Although Reagan has eased the pressure on the Brazilian-German nuclear agreement a little, in comparison with the Carter government, the North American position is still one of refusing each and every transfer of sensitive nuclear technology to the countries which have not yet joined the Atomic Club.

The Argentine nuclear program has an advantage in this respect, because it calls for its self-sufficiency in a shorter period of time, although it also poses many doubts, such as reprocessing, and those in the realm of the transfer of technology. The construction of the major components for the nuclear powerplants requires a technical and industrial capacity which, from every indication, Argentina has not yet achieved. For that reason, the present cooperation between the two countries will fill some gaps. Argentine private industry will manufacture for Atucha-2 some components such as steam generators, the pressurizer and the heat exchangers for the moderator. Other parts will be manufactured in Germany and Japan, including the pressure receptacle, which will be the largest ever built in the world to date. With this receptacle, to be built in Japan, NUCLEP [NUCLEBRAS Heavy Equipment, Inc.] will manufacture the lower part of the receptacle.

This presumably demands skills not yet available in the country, while Argentina will provide us with the circular code, and will lend us uranium concentrate, through a mutual contract whereby Brazil will pay with its own uranium, increased 6 percent per year over the initial tonnage lent. There is evidence in both countries of a very great desire to rise in the scale of nations which can enter the nuclear era, or which already have done so. In this rating, which is accepted internationally, occupying first place are the countries which possess technology, a bomb and large uranium reserves, such as the Soviet Union and the United States. In second place are the countries which have little technology but much uranium, such as Canada and Australia. In third place are countries which have technology already developed, but which lack uranium, such as France, Great Britain and Germany. In fourth place are countries such as Brazil and Argentina, lacking uranium and technology, but potentially capable of obtaining both. In this connection, we would do well to remember that claiming to possess vast uranium reserves means nothing, because those reserves must fit into the international patterns of extraction costs; something which does not appear to be happening yet with our Poços de Caldas deposit. Despite the official triumphalism, as we can observe, the path is a long and difficult one, both for Brazil and for Argentina.

2909
CSO: 5100/2276

NUCLEAR TECHNOLOGY TO BE OFFERED TO ALGERIA

Brasilia CORREIO BRAZILIENSE in Portuguese 4 Jun 81 p 6

[Excerpts] Brazil and Algeria have decided to create a binational company to conduct research in the areas of petroleum and minerals, as part of the agreement on scientific and technical cooperation signed yesterday in Brasilia, which also calls for the transfer of nuclear technology. These measures are a result of the visit by the Algerian finance minister, M'hamed Yala, who is simultaneously chairman of the OPEC Council of Ministers of Finance.

Moreover, the Algerian minister announced that his government had requested private industry to study participation in Algeria's 5-year development plan, in the sectors of agriculture, industry, investment, housing and personnel training. He claimed that Algeria is interested in sending technicians for internship in the Brazilian institutions, particularly those related to nuclear power. He added that the selection of Brazil as a partner is based on its terms for carrying out the transfer of technology without any reservations, with opportunities for the binational companies to operate in third countries.

Algeria is also interested in alternate energy sources, such as solar and biomass, as well as alcohol burning engines, based on recognition of the fact that the oil at its disposal is a nonrenewable resource. Minister Yala declared: "We want to progress rapidly, so as to be prepared for the post-petroleum phase, and Brazil has had long experience in the area of alternate energy, from which we hope to benefit."

Political Act

At the signing of agreements yesterday between Brazil and Algeria in the scientific-technical and commercial areas, Foreign Minister Saraiva Guerreiro said that the documents would respond to the mutual concern of the two governments to explore all the possibilities for horizontal cooperation open to Third World countries, in addition to affording an intensification of the bilateral exchange. With Finance Minister M'hamed Yala, a joint Brazilian-Algerian Commission was established, which will meet every 2 years.

Speaking after the signing of the acts, the Algerian minister remarked that, in the meeting granted by President Figueiredo and the one with Foreign Minister Guerreiro, he had observed identical views shared by Brazil and Algeria "on all the major international problems."

Yala mentioned the focal points of tension in the Middle East and Africa, particularly in the Sahel region, claiming that his country "appreciates the moral and material support which Brazil has never failed to provide for all just causes."

With regard to a problem in the area of trade between Brazil and Algeria, which occurred in 1976 when a Brazilian firm attempted to bribe an Algerian state company to guarantee facilities for marketing its products, Minister Yala said that this had never interfered with the relations between the two countries. He said that it involved a "dispute of a commercial nature, which was resolved amicably, and this is proven by the increase in commercial exchanges since 1976, wherein $240 million was registered last year."

3909
CSO: 5100/2274

CNEN SEES NO RISK IN OSIRAK REACTOR BOMBING AT LATER DATE

Rio de Janeiro JORNAL DO BRASIL in Portuguese 4 Jun 81 p 14

[Text] Even if the Osirak research reactor were ready and prepared to operate (which is rather unlikely), the Israeli bombing would not cause any danger of atomic radiation. Technicians from the National Nuclear Energy Commission (CNEN) claimed that it was impossible for radioactivity to escape from a reactor in which the uranium is not yet in a fission process.

In its natural state, uranium has low radioactivity. A piece of natural uranium could even be handled by a human without danger. Therefore, even if bombs had reached a uranium deposit, that would not affect the natural radioactivity of this type of fuel.

Low Degree

According to the technicians, a research reactor is totally different from a power reactor installed in power generating plants. Generally speaking, the research reactors have slight power. They can operate with highly enriched uranium, but generally the degree of enrichment of the uranium which they consume is low.

There are in Brazil three research reactors, one of which (that of IPEN [Nuclear and Energy Research Institute], at Sao Paulo University) is the same model as the Iraqi reactor bombed by the Israelis. It is the so-called "pool" type, in which the core of the reactor (in which the fission of the uranium takes place) is submerged in water.

The IPEN reactor was installed in 1957. It operates with highly enriched uranium (93 percent). To make a comparison: the Angra I reactor will consume 3 percent fissile uranium. This fuel was provided by the United States, but it is no longer sold to Brazil. The purpose of the IPEN reactor, in addition to training personnel, is to produce radioisotopes. Its power is 2 megawatts (very small compared with that of the Iraqi reactor, the power of which was 70 megawatts), but sufficient to produce radioactivity.

Ilha do Fundao

Another Brazilian reactor, also of the "pool" type, has been operating since 1960 at the CDTN (Nuclear Technology Development Center), belonging to NUCLEBRAS [Brazilian Nuclear Corporations], in Belo Horizonte. Its power is less, only 100 kilowatts.

Finally, there is a third reactor completely installed in the country: that of the CNEN itself, which operates at the IEN (Nuclear Energy Institute) on Ilha do Fundao. It produces only 100 watts, and hardly generates any radioactivity. It is used only for training personnel.

The technicians explained that all the Brazilian research reactors are protected by buildings with thick reinforced concrete walls. The IPEN reactor in Sao Paulo is located in the center of a four-story building. In the event of a bombing, it would have to destroy the building and also a thick wall of double reinforced concrete around the reactor itself.

2909
CSO: 5100/2274

IPEN CONDUCTS OWN RESEARCH, PRODUCES URANIUM HEXAFLUORIDE

Rio de Janeiro GAZETA MERCANTIL in Portuguese 4 Jun 81 p 9

[Text] The Nuclear and Energy Research Institute (IPEN) disclosed to this newspaper that it has now produced uranium hexafluoride with its own technology, something which represents an alternative endeavor to the Brazilian-German nuclear agreement. The IPEN production is still on a small scale (as much as 2 kilograms per hour), but it is a result of 15 years of work, interrupted and delayed by the government itself, which in 1979 decided to import a plant from the French firm Pechiney, established in Minas Gerais, according to IPEN sources.

Two years ago, the superintendent of IPEN, Ernaui Amorim, complained about the purchase, because his staff had been working for 13 years on the hexafluoride projects and would soon have met the national requirements, with its own technology, On that occasion, IPEN was already producing uranium hexafluoride (UF-4). The minister of mines and energy, Cesar Cals, now states that "IPEN's work should not be influenced by that of Pechiney."

In any event, using the concentrate ("yellow cake"), Brazil needs to obtain hexafluoride UF-6 (a gas under high pressure, which can be stored in tanks) that is the basis for the enrichment of uranium at 3 percent, usable as fuel in the Kraftwerk Union (KWU) PWR nuclear powerplants. In other words, the UF-6 is part of the cycle for the Angra II and III powerplants under construction.

However, the contributions from IPEN over the medium and long terms are considerably more extensive. In an internal text prepared by Ernani Amorim, one notes that IPEN, in the chemical engineering center, is using pilot plants for conversion and purification of uranium and thorium, in addition to producing microspheres of uranium and thorium oxides. In the nuclear metallurgy center, there are facilities for the calcination and reduction of uranium compounds, and the manufacture of sintered uranium oxide and carbide cake. And, in the nuclear engineering center, helium and water circuits under pressure are being installed and operated to simulate the working conditions in HTGR (high temperature) and PWR (water under pressure) reactors.

According to physicists Claudio Rodrigues and Spero Penha, a team from IPEN is conducting "not all, but several special, less conventional tests, for the philosophy on guaranteed quality control for the Brazilian nuclear industry." In addition, Amorim reported that "IPEN is also equipped to determine operational parameters, thermal characteristics and those of materials, and to make tests of concrete pressure receptacles for reactors, as well as studies and designs for their parts."

At present, Spero Penha is coordinating a project in the field of physical optics, "in a preliminary phase leading to future information in the nuclear fusion area, using the method of bombardment with laser beams or inertial confinement." According to Penha, IPEN has the cooperation of the University of Campinas in the undertaking. He also disclosed that "IPEN's option for laser based on solids was due to the long experience gained previously by Brazil, whereas the option based on gas would have necessitated a setback for the scientists."

Concurrently, the USP [Sao Paulo University] Institute of Physics opted for the development of the Tokamak line (which makes the magnetic confinement of the plasma), the originally Soviet system that is currently being developed by the United States (at Princeton and the University of Rochester).

2909
CSO: 5100/2274

BATISTA VIEWS HYDROELECTRIC-NUCLEAR COSTS, MILITARY ASPECT

Rio de Janeiro O GLOBO in Portuguese 7 Jun 81 p 36

[Excerpts from televised interview with NUCLEBRAS president Paulo Nogueira Batista, on 1 June 1981; place not given]

[Text] In an interview held last Monday on the TV GLOBO program "GLOBO Revista," the president of NUCLEBRAS [Brazilian Nuclear Corporations], Paulo Nogueira Batista, declared that the nuclear powerplants would prove to be cheaper than the hydroelectric powerplants to be constructed from now on in Brazil, owing to the long lines that will be required to transmit the power. Following are the major portions of the interview:

[Question] We are at the height of World Environment Week, and many of the demonstrations are aimed against the various nuclear programs. Why is nuclear power considered to be so predatory?

Nogueira Batista: In the first place, I would like to make an opening statement about the concern over the environment. I think that development cannot and should not take place without limitations at the expense of the environment. And in my capacity as president of NUCLEBRAS and hence the one responsible for the introduction of nuclear power for peaceful uses into Brazil, I am quite at ease making this statement, because I regard nuclear power as one of the cleanest forms of energy, and most compatible with the preservation of the environment, which is the object of so much concern, especially during this week's commemoration.

[Question] But, in the public's view, there are realities such as the accident at Three Mile Island, and now the one in the Japanese powerplant.

Nogueira Batista: These concerns are not actually related to the potential harm that nuclear power would represent to the environment, particularly its use for peaceful purposes. I even think that a very strong emotional factor is involved, linked with the way in which nuclear power has been introduced; that is, in the form of an atomic bomb, for destructive purposes of course. And, obviously, this violent introduction of nuclear power, beginning with a war-related effect, would necessarily cause great trauma to mankind, as, in fact, it has; so that there is a certain association, a kind of complex about an original sin which was committed and from which we have not as yet managed to absolve ourselves. But, on the contrary, rather than being a reason for rejecting the use for peaceful purposes, it should be an incentive.

[Question] Ambassador, is there only a peaceful use of nuclear power; in other words, when we are preparing for the mastery of nuclear technology, to what extent are we not also causing the technology to accompany a military or strategic aspect, at least?

Nogueira Batista: There is, to some extent, ambiguity with regard to nuclear power, inasmuch as the technology, within certain limits, can serve either of the two purposes. But the differences are considerable as well. The nuclear programs for peaceful uses are not susceptible to utilization for military purposes.

The military programs were not byproducts of civilian programs; on the contrary, it is the civilian programs which were byproducts of military programs. This intrinsic risk does not actually exist, because there is an entire international system of safeguards for peaceful use of nuclear power, which allows for the detection of any attempt at utilization for military purposes. And this is accomplished through control of the volume of material that could be used to manufacture a military device.

[Question] But however the technology is developed for peaceful uses, we would be ready to make the atomic bomb.

Nogueira Batista: We would not be ready, because, for a country to declare itself capable of producing the atomic bomb, it does not suffice to have the technology associated with the production of nuclear fuel available. There must also be an entire military strategy, a military doctrine related to the use of atomic weapons, with an entire political context involving the assessment of the external risks that a country might possibly undergo, as well as the need to develop a specific technology for the manufacture of the weapon. The mere fact of having the raw material for the atomic bomb does not mean that a country is ready to manufacture it, much less have an intention of doing so.

[Question] Taking the country's present requirements into consideration, do you think that the construction of nuclear powerplants at an estimated cost of $30 billion is a proper priority?

Nogueira Batista: This is not the cost, but I shall comment on this question. The answer is yes, for the reasons which I shall explain. Our hydraulic potential, which is currently 210,000 megawatts, is a potential equal to the rate of increase in the country's demand for electricity, according to official forecasts made by the responsible organs of ELETROBRAS [Brazilian Electric Power Companies, Inc] itself. If this potential were totally used, it would be depleted about the year 2000 or 2002. If we consider the fact that, in order to complete a nuclear powerplant, we need at least 10 years of planning, this gives us an idea of how close this horizon is. If we were to embark upon an exclusive utilization of the hydraulic potential, assuming that it was totally available, even in that period of time, by the year 2001 or 2002 we would have to have other solutions. By the year 2000, we shall have 200,000 megawatts of installed capacity, all of it hydraulic, based on an alternative proposal. And by the year 2003 and 2004? We would have to add, as a modest figure, 5 percent to this installed capacity. Nearly 10,000 megawatts would have to be added per year, which could no longer be hydraulic, but would have to be nuclear, or from coal. And these powerplants would have to be started at least 10 years earlier, in 1991 or 1992. So Brazil must begin now to master this

technology, from an industrial standpoint, and to have the capacity to plan, to manufacture components and to manage the construction of the powerplants.

[Question] How many thousand kilowatts will be generated by these eight powerplants in the Brazilian Nuclear Program?

Roquette Batista: These powerplants, each with 1,000 megawatts, will produce approximately 10,000 megawatts. That is the initial plan. This allows me to clarify the matter of cost, which is not really $30 billion. We estimate that the cost of these powerplants may amount to $1,400 per installed kilowatt, and therefore, $14 billion. The figure of $30 billion was one issued out of context, at a certain point in time, by someone in the electric sector, who included in that calculation, beforehand, any monetary correction in the price up to the date of completion of the first powerplant, and extrapolated the rationale for the entire program, arriving at a figure of $30 billion. This is because he started with $1,500 and calculated that, 7 years later, with an average inflation of 10 percent per year on the dollar, the powerplant would cost twice as much: $3,000, which, when multiplied by 10,000, resulted in $30 billion. This is not correct because, if we were to make the calculation in this way, we would have to apply the same reasoning to everything being done in Brazil.

[Question] All these powerplants will generate 10,000 megawatts; this is equivalent to less than one Itaipu. And, by 2000 or 2001, we shall have over 200,000 megawatts of electricity production. Its contribution to the total Brazilian power will be very small.

Roquette Batista: I was speaking about nine powerplants in 1995. Now we are talking about total installed capacity for generating electricity amounting to 200,000 by the year 2002, which is ELETROBRAS' estimate. It makes a 7-year difference. We shall produce one powerplant per year, and then two or three per year; and we shall certainly have at least 20,000 megawatts installed.

[Question] Is the nuclear kilowatt three times more expensive than the hydraulic one?

Roquette Batista: Absolutely not; first, because there is no standard cost for the hydraulic kilowatt. Each hydraulic powerplant has a different price. And the nuclear powerplants could have a standardized price, because they are to some extent independent of location. This is not the case with the hydroelectric powerplant. So, a standard hydroelectric price cannot be cited for such a comparison. What we have at present is the following situation: The installed nuclear kilowatt, related to what is still a pioneer activity in Brazil, this nuclear kilowatt, is now more expensive than the kilowatt from the hydroelectric powerplants in operation or under construction. But it will not be more expensive than that from a large number of hydroelectric powerplants yet to be constructed.

[Question] How much of a percentage more expensive?

Roquette Batista: It depends on the utilization. If we make the comparison with Balbina, Balbina is more expensive. If we make the comparison with Itaipu, Itaipu

to change, because it is an exceptional utilization of hydroelectric power; so much so that Brazil expended all this political and diplomatic effort to make the construction of Itaipu possible, because it is convinced that Itaipu is a utilization of hydroelectric power under remarkable conditions, affording a cost that can no longer be obtained in Brazil.

[Question] Another point: why is it that, in building a nuclear powerplant, only a beautiful site is selected?

Maguire Batista: Because, for a nuclear powerplant, there must be a cooling system that is as natural as possible; hence the search for the seaside, the shore, as a solution for this problem. It is not our fault that the Brazilian shore is very beautiful; but we shall inevitably find beautiful beaches for the location of nuclear powerplants.

[Question] Does Itaipu have any dangers? Could it be a Three Mile Island?

Maguire Batista: There is always the seismic problem in any hydroelectric powerplant, because the large dams must be very well designed to preclude the possibility of a break. A break in a dam of the Itaipu type, with that reservoir of water, could cause a serious catastrophe. But the design is always made with a very large degree of conservatism, and there is not the slightest danger of this being able to occur.

[Question] Brazil and other countries are seeking the mastery of nuclear technology. But in other countries as involved as we are the people are consulted. The people are asked whether they want the nuclear powerplant. They hold referendums. Why is it that in Brazil, involved in a similar program, the same thing is not done, asking the people whether or not they want the powerplant?

Maguire Batista: In the first place, it is not correct that there is such a consultation. On the contrary, as a rule the decision is made without any consultation. This holds true in the United States, Great Britain and France.

[Question] A referendum was announced in France.

Maguire Batista: There was a referendum in Sweden which favored nuclear power, and one in Austria which did not favor it.

[Question] The people are the ones who pay for this nuclear program, and have a right to express their opinion.

Maguire Batista: For a country to hold a referendum, its laws must allow for that, and there must be a tradition of using the referendum. The referendum is a form of direct democracy, which is not the kind that Brazil is traditionally used to practicing. The Brazilian tradition is that of a representative form of government. It is impossible to conceive of direct forms of democracy for solving this type of problem. And, primarily, it would be extremely risky to adopt this type of solution. The consequences would be disastrous and contradictory. There are two examples: one hypothetical, and the other real. Austria was one of the three countries in which there was a referendum on nuclear powerplants, and where it

proved to be negative. In Sweden and Switzerland, they proved to be positive. In Austria, a nuclear powerplant in the Vienna area did not go into operation, and the country is suffering the harm of having that plant immobilized,without obtaining the power that it could generate. And less than 100 kilometers away, on the border, there are Czech nuclear powerplants. Austria's problem was not resolved. It is impossible to expect a referendum to be able to resolve an issue of national scope, because it is being proposed in Sao Paulo and Rio Grande do Sul that the population of the municipalities be heard from. But if we were to hear from the population in the municipalities that were flooded to accomplish the utilization of hydroelectric power on the Rio Grande and Rio Parana, which provides power to Rio and Sao Paulo, what would be the response from the citizen whose farm was flooded, or from the resident of a certain town who was forced to leave with his family? Would they be entitled to decide for everyone?

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BRIEFS

URANIUM HUNT--The search for uranium in Guyana's interior is to be restarted sometime in September, a top spokesman for the Cogema exploration firm said yesterday. The project which is being conducted from the Kurupung base of the firm, was suspended as a result of the heavy rainfall since early April. Cogema, a French firm has been given the green light to search for uranium in about 70,000 square miles of Guyana's territory, and government is following the progress of the project very keenly. Cogema which has been in Guyana for two years, repo.tedly identified uranium radiation last year. Uranium radiation is said to be an indication of possible deposits. The firm also announced that it would set up a multi-million concentration plant if deposits were found in commercial quantities. [Excerpt] [Georgetown GUYANA CHRONICLE in English 10 Jun 81 p 1]

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FIRST CONFERENCE ON NUCLEAR POWER HELD

Damascus SYRIA TIMES in English 18 Jun 81 p 2

[Text] Under the slogan of "Nuclear Energy is a Scientific Necessity for Meeting Future Needs, and an Important Step towards Arab Economic Integration", the first Arab Conference on Nuclear Power continued its sessions here.

Over 40 Arab and foreign states and organizations are participating in this scientific meeting which is held for the first time in the Arab world. The conference discussed the best and most economical means for generating electric power by means of different alternatives particularly by nuclear energy as the Electricity Minister says in the opening session of the conference.

Syria Times (ST) interviewed some researchers. Following are excerpts from their answers on the question:

"What are your impressions and suggestions on this conference"?

1. Dr Mohammed al-Imadi, the Director-General of the Arab Fund for Economic and Social Development said:

It is clear that energy is one of the world's major issues of our times and of future generations and it is of the same importance in the Arab world. Arab economists have been thinking about this issue and its relation to economic and social development for a long time. We are happy to see Syria giving a special attention to this issue.

In the Arab world as a whole, one has to notice that energy consumption has been increasing at a high rate amounting to 12% per annum and it is expected to continue at almost the same rate for the future. Our calculations show that our oil and gas will last but more than 40 years, other sources of energy are limited, we have no choice but to go nuclear, for that it appears that electricity from nuclear generation is the most promising.

The Arab countries' potential of uranium reserves are estimated to range from 150 to 500 thousand tons in addition to uranium traces found associated with phosphates which gives the nuclear choice a greater force.

Of course there are many problems and considerations which have to be faced by the authorities, among them the human and physical infrastructure needed for building a nuclear power plant.

I believe that the development of nuclear energy in the Arab world cannot be achieved without cooperation among Arab countries in planning, training, and research.

The conference was successful, thanks to the efforts of the Minister of Electricity in holding such a conference, especially it is the first of its kind in the Arab world.

The Arab Fund presented a paper on "the demand for nuclear energy in the Arab world".

It showed that this demand will increase up to 516 gigawatt in the year 2000, which means that installed capacity has to increase from 27 thousand megawatt to 160 thousand megawatt. The paper explained the different alternatives to ensure the required capacity and reached the conclusion that the Arab countries have to enter the nuclear era.

Mr Hamdi Bin Nasser Al-Uwais UAE Minister of Electricity answered:

The first Arab Nuclear Power Conference is the first of its kind in the Arab world, and as a beginning it is a successful one. Co-operation and co-ordination between Arab countries are essential to make nuclear power plants more economical. The most important point in utilizing nuclear power plants is to make interconnected networks between the neighbouring Arab countries.

As the nuclear technology is new to the Arab world, the U.A.E was eager to attend this conference to discuss with its brothers in Arab countries the setting up of nuclear power plants for peaceful purposes.

M. Osama B. Dabbousi, Professor of physics, University of Petroleum and Minerals, Dhahran, Saudi Arabia, said:

In this conference we see many studies about the future energy demands and supplies both globally and in the Arab world. The contributors to the conference agreed that oil would last a little more than 30 years at present consumption rate, also nuclear energy using thermal reactors will be very expensive in about the same time. Oil and nuclear energies are the only two sources of energy available in the Arab world. Other sources such as solar energy and fusion are not feasible for industrial use with present technologies. The answer to the energy supply question is in the use of breeder reactors again requiring a high degree of technical capabilities, thus meaning that future energy requires our entering into areas of high technology.

CSO: 5100/4733

BRIEFS

NO POWER PLANTS--Energy Ministry experts are of the opinion that no nuclear power station will be set up in Israel before the end of the decade. In a paper they prepared, they expect that efforts toward research to develop new sources of fuel will not contribute to Israel's economy, at least not within the next 10 years. [Text] [TA260640 Jerusalem Domestic Service in Hebrew 0600 GMT 26 Jun 81]

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SYRIA PLANS TO DEVELOP ITS NUCLEAR CAPACITY

London 8 DAYS in English No 25, 27 Jun 81 p 17

(Article by Michel Sawed-Cousins and Shada Islam)

(Text) ONLY TEN DAYS after Israeli planes attacked Iraq's nuclear research centre near Baghdad, Syria hosted the first Arab Nuclear Energy Conference in Damascus. Eleven Arab countries attended, though Iraq was absent. According to the Syrians, the aim of the conference was to prepare the ground for nuclear development in the region, but the most important information to come out of the meeting was that both Syria and the UAE are to build their own nuclear power stations.

So far, Libya has the most advanced programme among Arab countries for nuclear development, with the Soviets constructing a 440MW power station that the Libyans hope will be operational by 1986. They already have a small operational research reactor, also installed by the Soviets. The most ambitious programme however, is Egypt's, which also has a small operating Soviet-built research reactor. Six reactors have already been ordered, two each from France, the US and Canada.

Syria's nuclear programme has been well-known for some time. Last year, the deputy minister for electricity said that Syria needed to build six 600MW reactors at the then cost of $3.6bn to meet the growing demand for electricity, which is expected to rise seven-fold by 1990.

At the moment, however, it seems the Syrians are concentrating on just one plant, which will probably cost around $1bn. Syrian Electricity Minister Omar Yousef told the conference that the first reactor would be ready by 1991, around the same time that UAE Minister of Electricity and Water Hamed bin Nasser al Owais announced that the UAE would have theirs.

The consultancy contract for Syria's nuclear programme, worth around $5m, has been in the offing for well over a year but still has to be awarded. The Swiss company Electrowatt Engineering has hopes of picking it up, but the Syrians have expressed interest in links with Belgian companies. Omar Yousef was in Brussels a few days before the conference, to look at the possibility of Belgian aid for the development of Syrian nuclear technology. He also visited Belgian nuclear plants and held discussions with local specialists in the field. Belgium, which has three nuclear power stations and is planning another four, is in the top rank of world nuclear energy consumers: 18.5 per cent of its electricity comes from nuclear generation.

Coming a few days after the Israeli attack on the nuclear reactor in Iraq, the Syrian visit and Syria's interest in nuclear cooperation with Belgium was largely ignored by the local press and played down by the foreign ministry. Like Iraq, Syria has signed the Non-Proliferation Treaty.

Omar Yousef was invited by the Belgian minister for external trade, Robert Urbain, who indicated his country's keen interest in developing technological cooperation with Syria.

Belgian assistance, Urbain is believed to have told his Syrian colleague, would focus

on the supply of equipment for power plants, and training programmes for Syrian scientists and technicians. No final agreement is believed to have been signed by the two sides, although such major Belgian firms as Belgo-Nucleaire, Electrobel, Acec and Tabocom are expected to continue contacts with the Syrian government. These firms have been involved in similar deals, including the preparation of feasibility studies, supply of motors, cables, alternators and so on, with Algeria, Iraq and Libya.

The shadow of the Israeli raid on the Iraqi nuclear reactor clearly loomed large during the Syrian visit to Brussels. Belgian sources went out of their way to stress that energy cooperation with Syria would not 'focus specifically on nuclear power'. Speaking to *8 Days* correspondent Shada Islam, Omar Yousef stressed that the Israeli 'aggression' would not 'affect our policies and development plans. It would only increase our determination to develop anything which may support our national economy, including nuclear energy for peaceful purposes only.'

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BRIEFS

URANIUM FOUND IN COAL--Ankara, 22 June--Turkish officials are examining a report that coal containing significant quantities of uranium had unknowingly been exported to Romania, a military spokesman said today. He said the report alleged there was a strong possibility that uranium was present in the coal, mined at Yatagan, near the Aegean coast. The report was drawn up by the Ministry of Minerals and Natural Resources, which sent nuclear physicists to Yatagan to examine the coal. The newspaper HURRIYET said the scientists found a seam of coal containing uranium. Turkey had exported 1.5 million tonnes of coal to Romania in the past. The authorities became suspicious when Romania insisted on the low-grade coal when it was offered a higher grade because supplies from Yatagan were interrupted, the paper said.--NAB/Reuter. [Text] [Rangoon THE WORKING PEOPLE'S DAILY in English 24 Jun 81 p 6]

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